WASTE MANAGEMENT PLAN

SSD-35962232: Burrows Road Multi-level Warehouse, St Peters

Prepared for:

Goodman Property Services (Aust) Pty Ltd
ABN: 40 088 981 793
The Hayesbery
1-11 Hayes St
Rosebery NSW 2018

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BASIS OF REPORT

This report has been prepared by SLR Consulting Australia Pty Ltd (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Goodman Property Services (Aust) Pty Ltd (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

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DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
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Glossary and Abbreviations

Reference	Description
BCA	Building Code of Australia
Council	City of Sydney
DCP	Development Control Plan
DPIE	Department of Planning, Industry and Environment
NSW EPA	NSW Environment Protection Authority
The Guidelines	City of Sydney's Guidelines for Waste Management in New Developments
SEARs	Secretary's Environmental Assessment Requirements
SSDA	State significant development application
WMP	Waste Management Plan

1 Introduction

1.1 Overview

This waste management plan has been prepared by SLR Consulting to accompany a state significant development application (SSDA) for a proposed warehouse and distribution centre development located at 1-3 Burrows Road, St Peters (the site).

This report has been prepared to calculate waste quantities, ensure enough space is allowed for waste storage and that waste is properly handled during the demolition, construction and operational phases of the project.

As summarised in Table 1 below, this report has also been prepared to address the relevant the Secretary's Environmental Assessment Requirements (SEARs) issued by the Department of Planning and Environment (DPE) for SSD-35962232 on 7 February 2022.

Table 1 SEARs requirements – SSD-35962232

Item	Conditions for Waste Management	Relevant Sections of WMP
17	Waste Management - Identify, quantify and classify the likely waste streams to be generated during construction and operation.	Construction waste types and classifications can be found in Table 3 Construction waste quantities can be found in Table 7 Operational waste types and classifications can be found in Table 9 Operational waste quantities can be found in Table 11 and Table 12
	- Provide the measures to be implemented to manage, reuse, recycle and safely dispose of this waste	Construction waste management and disposal is covered in Section 7 Methods for reuse and recycling of construction waste are provided in Section 7.6 Operational waste management and disposal is covered in Section 8 Methods for reuse and recycling of operational waste are provided in Section 8.10
	- Identify appropriate servicing arrangements for the site.	Bin numbers and types for this development are detailed in Section 8.5.2 Service arrangements are details in Section 8.9
	- If buildings are proposed to be demolished or altered, provide a hazardous materials survey	Subject to a separate study and report

1.2 Objectives

The principal objective of this WMP is to identify all potential wastes likely to be generated at the Development during the demolition, construction and operational phases, including a description of how waste would be handled, processed and disposed of, or re-used or recycled, in accordance with Council's requirements.

The specific objectives of this WMP are:

- To encourage the minimisation of waste production and maximisation of resource recovery.
- To assist in ensuring that any environmental impacts during the operational life of the Development comply with Council's development consent conditions and other relevant regulatory authorities.

2 Site Context

2.1 Site Description

The land to which this SSDA relates is located at 1-3 Burrows Road, St Peters (the site). The site comprises two parcels of land (allotments) and is legally described as follows:

- Lot 1 DP 1227450; and
- Lot 11 DP 606737.

The site is an irregular shaped allotment with a total area of approximately 34,614 m^2. The site adjoins Burrows Road to the east with a primary curved frontage of approximately 528 m and adjoins Canal Road to the west with a secondary frontage of approximately 289 m.

The site is located in the City of Sydney at the junction with the Inner West and Bayside local government areas.

The site is currently occupied by older low-rise industrial units that are largely consistent with development in the surrounding area which is predominantly of an industrial nature. The industrial units comprise four large format steel framed warehouse and distribution facilities. These buildings no longer meet the requirements of contemporary industrial users in this market.

The site is situated within an established largely industrial area to the immediate south of the St Peters WestConnex Interchange and well-connected to the Sydney Airport. The locality surrounding the site is characterised by existing industrial and commercial developments, as well as new road and other major transport infrastructure. The Alexandra Canal is located approximately 100 m to the south-east and east.

An aerial image of the site is provided in Figure 1 below.

Figure 1 Aerial image of the site

Source: Urbis

3 Project Background

3.1 Planning Proposal PP-2020-298

The applicant obtained approval on 16 September 2020 for a Planning Proposal (PP-2020-298) at the site. The approved Planning Proposal amended the Sydney Local Environmental Plan 2012 (SLEP 2012) by increasing the applicable maximum building height for the site from 18 m to 30 m. The Planning Proposal also introduced a set of site-specific controls for 1-3 Burrows Road, St Peters, in the SLEP 2012, including a 6 m setback control to Burrows Road and Canal Road for landscaping purposes.

3.2 Competitive Design Alternatives Process

Goodman undertook a Competitive Design Alternatives Process (competitive design process) with three selected architectural firms following an expression of interest process.

The Selection Jury resolved that the Welsh and Major scheme best demonstrated the ability to achieve design excellence as per Clause 6.21 of the Sydney LEP 2012 and the scheme which best met the design, planning and commercial objectives of the Competition Brief. The Welsh and Major scheme was subsequently awarded the winner of the Competitive Design Process.

SLR has been working in close collaboration with Goodman and the Welsh and Major throughout the preparation of this SSDA and generally as part of the ongoing detailed design phase of the project.

4 Proposed Development

The vision for the project is to transform the site into a functional and adaptable multi-storey industrial warehouse building that will support industrial expansion in this highly accessible location and build upon strong ecommerce drivers close to Sydney Airport, Port Botany, Cooks River Intermodal Terminal and the Sydney CBD.

This detailed SSDA follows on from the competitive design process undertaken between January and April 2022, whereby, the winning project architects Welsh and Major were announced by the Selection Jury.

This proposed SSDA seeks approval for the following:

- Demolition of all existing structures and buildings on site.
- Site remediation and establishment works.
- Design, construction and operation of a three-storey industrial warehouse and distribution centre building with an ancillary office building, including:
  - Approximately 52,150 m^2 of total GFA, comprising:
    - 47,076 m^2 of warehouse and distribution centre GFA, and
    - 5,014 m^2 GFA for ancillary office space
    - Café tenancy in the ground floor lobby space of 60 m^2 GFA.
  - Maximum building height of RL 33.18 (30.14 height in metres).
  - Operation 24 hours per day seven days a week.

- Provision of a single storey undercroft car parking area accessed off Burrows Road which provides 224 car parking spaces, including 12 accessible bays, 17 service vehicle spaces for vans and utes, 19 motorcycle spaces, and bicycle parking, 15 visitors spaces, and end of trip facilities, including 58 bicycle parking spaces, showers, lockers and change rooms for occupants.
- New crossings to Burrows Road for truck and car access
- Single fire and utilities services ingress crossing off Canal Road
- Site landscaping works totalling approximately 7,464 m^2, or 21.6% of the site, including two, six-metre landscaped setback areas to both the Burrows and Canal Roads site frontages and the following provisions:
  - 5,293 m^2, or 15.3%, deep soil landscaping and
  - 5,074.82 m^2, or 14.7%, tree canopy coverage.
- Provision of building and business identification signage
- Provision of two chamber substations.

This waste management plan has been prepared to support the SSDA for the proposed warehouse and distribution centre at 1-3 Burrows Road, St Peters and provides information on the quantities of waste likely to be generated during the demolition, construction and operational phases and how this waste will be stored and managed on site.

The proposed development design is shown in Figure 2.

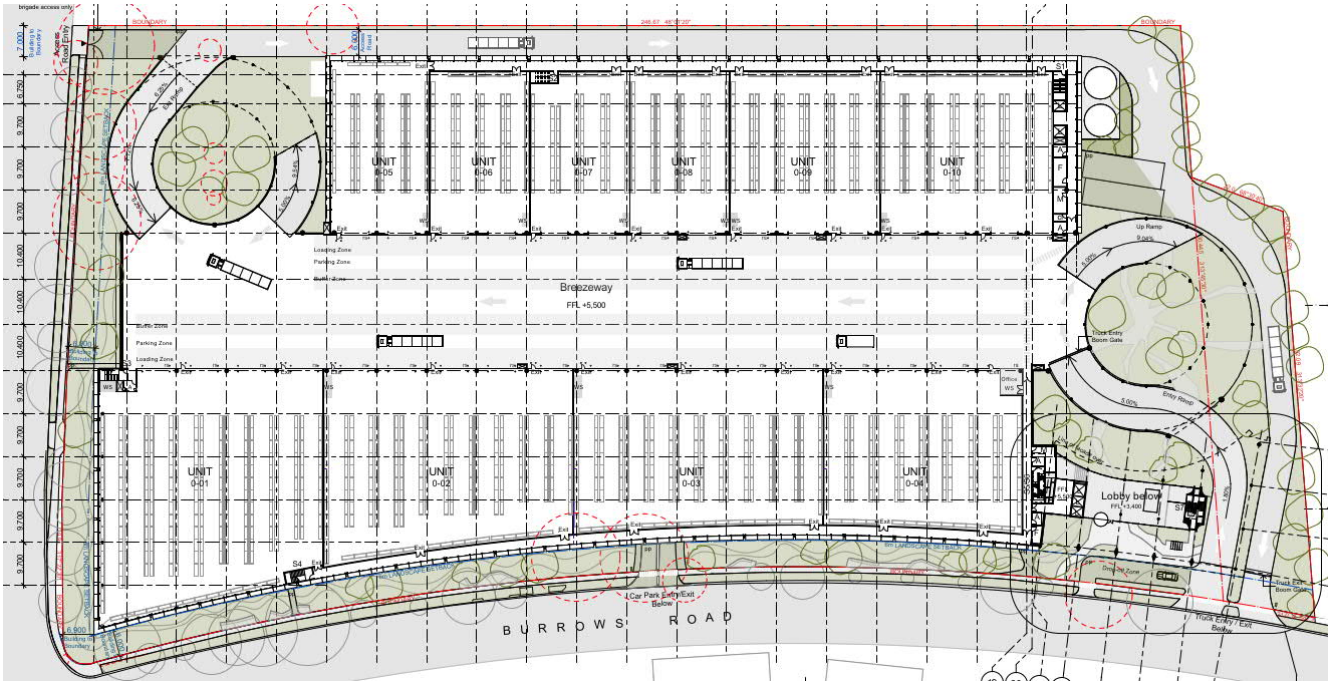

Figure 2 Proposed development design

5 Better Practice for Waste Management and Recycling

5.1 Waste Management Hierarchy

This WMP has been prepared in line with the waste management hierarchy shown in Figure 3. The hierarchy summarises the objectives of the Waste Avoidance and Resource Recovery Act 2001.

The waste management hierarchy comprises the following principles, from most to least preferable:

- Waste avoidance, prevention or reduction of waste generation. Achievable through better design and purchasing choices.
- Waste reuse, reuse without substantially changing the form of the waste.
- Waste recycling, treatment of waste that is no longer usable in its current form to produce new products.
- Energy recovery, processing of residual waste materials to recover energy.
- Waste treatment, reduce potential environmental, health and safety risks.
- Waste disposal, in a manner that causes the least harm to the natural environment.

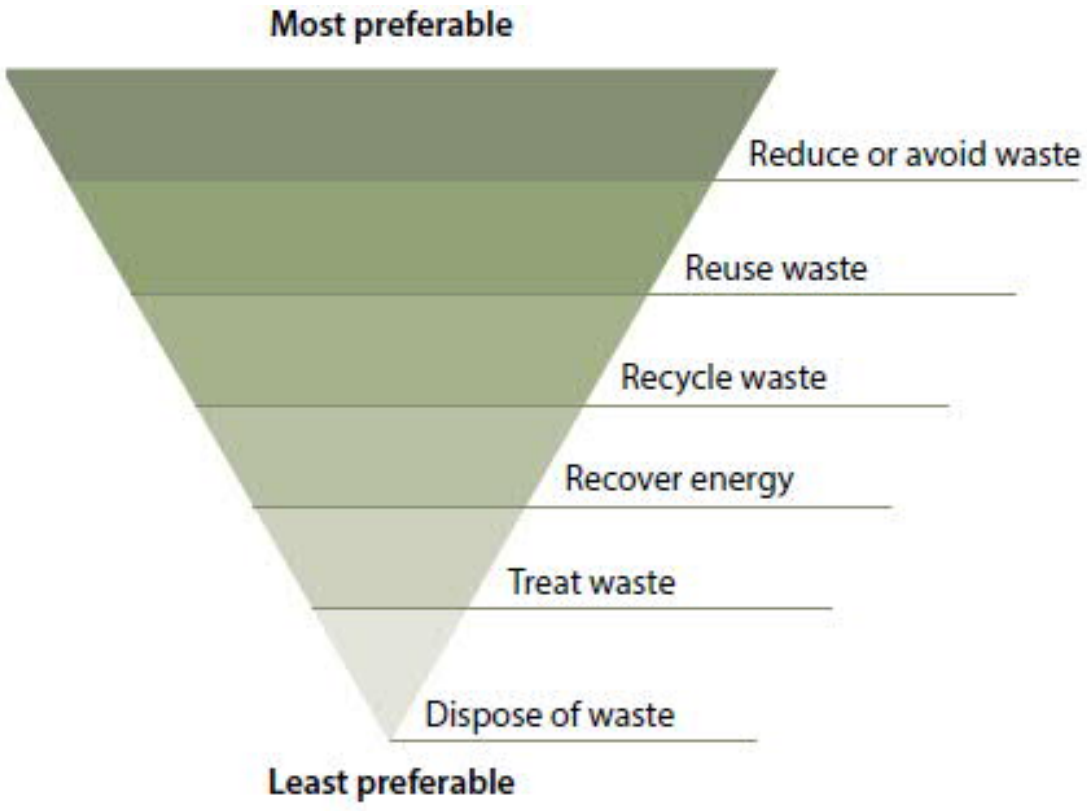

Figure 3 Waste Management Hierarchy

5.2 Benefits of Adopting Better Practice

Adopting better practice principles in waste minimisation offers significant benefits for organisations, stakeholders and the wider community. Benefits from better practice waste minimisation include:

- Improved reputation of an organisation due to social and environmental responsibility.
- Lowered consumption of non-renewable resources.
- Reduced environmental impact, for example, pollution from materials manufacturing and waste treatment.
- Reduced expenses from lower waste disposal.
- Providing opportunities for additional revenue streams through beneficial reuse.

6 Waste Legislation and Guidance

6.1 Overarching Legislation and Guidance

The waste legislation and guidance outlined in Table 2 below should be referred to during the operation of The Development.

Table 2 A list of legislation and guidance relevant to this report

Legislation and Guidance	Objectives
State and National legislation and guidelines	
Building Code of Australia (BCA) and relevant Australian Standards	The BCA has the aim of achieving nationally consistent, minimum necessary standards of relevant health and safety, amenity and sustainability objectives efficiently.
Council of Australian Governments National Construction Code 2019	The National Construction Code 2019 sets the minimum requirements for the design, construction and performance of buildings throughout Australia.
NSW EPA's Better Practice Guidelines for Waste Management and Recycling in Commercial and Industrial Facilities 2012	These better practice guidelines present information on waste minimisation and resource recovery as well as information on commonly used waste management provisions. The guidelines also provide benchmarks for assessing waste production rates in Australia.
NSW Waste and Sustainable Materials Strategy 2041: Stage 1 – 2021-2027	Replacing the NSW Waste Avoidance and Resource Recovery Strategy (2014-21), the NSW Waste and Sustainable Materials Strategy 2041 focuses on the transition of NSW to a circular economy. The strategy focuses on minimising what is thrown away, and to use and reuse resources more efficiently, making them as productive as possible. The strategy identifies the need to identify infrastructure needs, the mandating of separation of some organic waste streams, and incentivising biogas generation from waste materials.
NSW EPA Resource Recovery Orders and Resource Recovery Exemptions	The NSW EPA has issued a number of resource recovery orders and resource recovery exemptions under the POEO (Waste) Regulation 2014 for a range of wastes that may be recovered for beneficial re-use. These wastes typically include those from demolition and construction works, as well as ongoing wastes such as food waste. • Resource recovery orders present conditions which generators and processors of waste must meet to supply the waste material for beneficial re-use. • Resource recovery exemptions contain the conditions which consumers must meet to use waste for beneficial re-use.
NSW EPA's Waste Classification Guidelines 2014	The NSW EPA Waste Classification Guidelines assists waste generators to effectively manage, treat and dispose of waste to ensure the environmental and human health risks associated with waste are managed appropriately and in accordance with the POEO Act 1997 and is associated regulations.
Protection of the Environment Operations Act (POEO) 1997 and Amendment Act 2011	The POEO Act 1997 and POEO Amendment Act 2011 are administered by the NSW EPA to enable the NSW Government to establish instruments for setting environmental standards, goals, protocols and guidelines. They outline the regulatory requirements for lawful disposal of wastes generated during the demolition, construction and operational phases of a development, as well as the system for licencing waste transport and disposal.

Legislation and Guidance	Objectives
The Work Health and Safety Regulation 2017	The Work Health and Safety Regulation 2017 provides detailed actions and guidance associated with the topics discussed in The Work Health and Safety Act 2011. The primary aim of the regulation is to protect the health and safety of workers and ensure that risks are minimised in work environments. Workplaces are to ensure that they are compliant with the requirements specified in the regulations. The regulations discuss items such as actions that are prohibited or obligated in work environments, the requirements for obtaining licences and registrations, and the roles and responsibilities of staff in workplaces.
Waste Avoidance and Resource Recovery Act 2001	The Waste Avoidance and Resource Recovery Act 2001 aims to promote waste avoidance and resource recovery and repeals the Waste Minimisation and Management Act 1995. Specific objectives of the Waste Avoidance and Resource Recovery Act 2001 include: • encouraging efficient use of resources • minimising the consumption of natural resources and the final disposal of waste by encouraging the avoidance of waste and the reuse and recycling of waste • ensuring industry and the community share responsibility in reducing/dealing with waste, and • efficiently funding of waste and resource management planning, programs and service delivery. As of 2016, the addition to the Act of Part 5 defines the legislative framework for the 'Return and Earn Container Deposit Scheme' whereby selected beverage containers can be returned to State Government authorities for a monetary refund.

6.2 Council Requirements

6.2.1 Guidelines for Waste Management in New Developments

Requirements for waste management in new developments in the City of Sydney are covered in Council's Guidelines for Waste Management in New Developments (2018). These guidelines have been used to guide waste quantities and waste management the Development.

6.2.2 General

The Guidelines require that a waste management plan be prepared for this development. The plan must show:

- On drawings, the location and space allocated to the waste management systems and facilities and the nominated waste collection point for the site
- Details of the types and quantities of waste streams
- Access paths for users and collection vehicles
- Sufficient, dedicated space to collect and recycle food waste in kitchens, office tearooms, and service and food preparation areas
- Details of ongoing management, storage and collection of waste, including responsibility for cleaning, transfer of bins between storage areas and collection points, implementation and maintenance of signage, and security of storage areas
- Where appropriate, a summary document for tenants and residents to inform them of the building's waste management arrangements
- Details of the handling of construction, demolition and ongoing waste outputs of the development.

The Guidelines also specify that:

- A separate dedicated space such as a room, or a screened area in, or attached to, the waste and recycling storage area, is to be provided for storing bulky waste and problem waste for collection. For developments between 100 m^2 and 2,000 m^2, 4 m^2 must be provided with an additional 4 m^2 for each development over 2,000 m^2 and for every 20,000 m^2 of office space.
- Kitchens, office tearooms, and service and food preparation areas are to be designed with sufficient, dedicated space to collect and recycle food waste and must be indicated on plans
- All collection of non-residential waste is to be conducted on-site. Consideration will be given to smaller developments where this is not possible
- Waste collection points should be located wholly within the boundary of the development and in an area that minimises noise or odour impacts on nearby premises
- Space should be provided for the storage of food waste for collection. The space should be dedicated and in, or attached to, the waste storage area
- Space should be provided for the separate collection of beverage containers that comply with the NSW Container Deposit Scheme.
- The maximum manual handling distance between the storage room and the collection point is 10 m for 120 L, 240 L, 660 L and 1,100 L mobile bins
- The collection point is to be located where the waste or recycling collection vehicles can stand safely
- Secure space is to be allocated for the separate storage of liquid wastes, commercial cleaning products, chemicals, paints, solvents, and motor and cooking oil. These areas should be bunded, and drained to a grease trap, in accordance with legislation and the requirements of State government authorities and agencies
- Where collection takes place inside a building, appropriate clearances need to be allowed for the collection vehicle to enter the premises, clear the waste and recycling containers, and exit the premises.
- A separate dedicated space, such as a room or screened area, should be provided for the separate interim storage and management of stripout waste for re-use or recycling. This space is not required if the removal of old furniture and material is conducted by a professional stripout service or by the company hired for installing new items.

6.3 City of Sydney Advice on EIS

The City of Sydney provided advice in the EIS in a letter dated 16 May 2022. A summary of the section relevant waste management is shown below.

- The application must address the City of Sydney Guidelines For Waste Management In New Developments 2018
- The Guidelines requires facilities to minimise and manage waste and recycling generated by the proposal and demonstrate adequate provision for servicing of the site in relation to loading demands, size of waste collection areas and methods of collection to, from and within the site.
- Measures to reuse or recycle at least 80% of construction and demolition waste, either on site or diverted for reuse and recycling with receipts sufficient to demonstrate the target will be achieved.
- Waste and recycling generated during operation must be wholly located in a dedicated room or storage area

- Storage areas must provide adequate capacity for storing all the waste and recycling likely to be generated between collection cycles
- Waste and recycling storage areas must be detailed on architectural drawings.
- Documentation such as an operational waste management plan must demonstrate practices for the minimisation of litter generation and confinement of litter generated from the operation.

7 Demolition and Construction Waste and Recycling Management

7.1 Targets for Resource Recovery

Targets for new development are expected to contribute to state-specific targets. The NSW Waste and Sustainable Materials Strategy 2041 (DPIE, 2021) sets a target of 80% average recovery rate from all waste streams by 2030. Analysis by DPIE (2021) indicates that construction and demolition waste recovery rates in 2018-2019 were 77%.

It is anticipated that the waste minimisation measures in the following sections will assist the Development to meet these targets. Waste reporting and audits can be used to determine the actual percentage of wastes that are being, or have been, recycled during the site preparation, demolition and construction stages of The Development.

Waste generated during demolition and construction will be reused on site wherever possible, especially in the case of soil and fill. Waste and recyclables taken off site will be recycled, or disposed of, at facilities lawfully able to accept them.

7.2 Waste Streams and Classifications

The demolition and construction activities are anticipated to generate the following broad waste streams:

- Demolition waste as outlined in Section 7.3
- Construction waste as outlined in Section 7.4
- Packaging waste, and
- Work compound waste from on-site employees.

A summary of likely waste types generated from demolition and construction activities, along with their waste classifications and proposed management methods are provided in Table 3. For further information on how to determine a waste's classification refer to the NSW EPA (2014) Waste Classification Guidelines.[1] Further information on managing site preparation, demolition and construction wastes is also available on the NSW EPA website.[2]

[1] Available online from https://www.epa.nsw.gov.au/your-environment/waste/classifying-waste/waste-classification-guidelines
[2] Available online from http://www.epa.nsw.gov.au/your-environment/waste/industrial-waste/construction-demolition

Table 3 Potential waste types, classifications and management methods for demolition and construction

Waste Types	NSW EPA Waste Classification	Proposed Management Method
Demolition and Construction		
Sediment fencing, geotextile materials	General solid waste (non-putrescible)	Reuse at other sites where possible or disposal to landfill
Concrete	General solid waste (non-putrescible)	Off-site recycling for filling, levelling or road base
Bricks and pavers	General solid waste (non-putrescible)	Cleaned for reuse as footings, broken bricks for internal walls, crushed for landscaping or driveway use, off-site recycling
Gyprock or plasterboard	General solid waste (non-putrescible)	Off-site recycling or returned to supplier
Sand or soil	General solid waste (non-putrescible)	Off-site recycling
Metals such as fittings, appliances and bulk electrical cabling, including copper and aluminium	General solid waste (non-putrescible)	Off-site recycling at metal recycling compounds and remainder to landfill
Conduits and pipes	General solid waste (non-putrescible)	Off-site recycling
Timber	General solid waste (non-putrescible)	Off-site recycling; Chip for landscaping; Sell for firewood Treated: reused for formwork, bridging, blocking, propping or second-hand supplier Untreated: reused for floorboards, fencing, furniture, mulched second hand supplier, and remainder to landscape supplies.
Doors, windows, fittings	General solid waste (non-putrescible)	Off-site recycling at second hand supplier
Insulation material	General solid waste (non-putrescible)	Off-site disposal
Glass	General solid waste (non-putrescible)	Off-site recycling, glazing or aggregate for concrete production
Asbestos	Hazardous waste	Off-site disposal to a licensed landfill facility.
Fluorescent light fittings and bulbs	Hazardous waste	Off-site recycling or disposal, contact FluoroCycle for more information[3]
Paint	Hazardous waste	Off-site recycling, Paintback collection[4] or disposal
Synthetic rubber or carpet underlay	General solid waste (non-putrescible)	Off-site recycling, reprocessed for other uses
Ceramics including tiles	General solid waste (non-putrescible)	Off-site recycling
Carpet	General solid waste (non-putrescible)	Off-site recycling, disposal or reuse
Packaging		
Packaging materials, including wood, plastic, including stretch wrap or LDPE, cardboard and metals	General solid waste (non-putrescible)	Off-site recycling
Wooden or plastic crates and pallets	General solid waste (non-putrescible)	Reused for similar projects, returned to suppliers, or off-site recycling. Contact Business Recycling for more information[5]

[3] Available online from http://www.fluorocycle.org.au/ or http://www.environment.gov.au/settlements/waste/lamp-mercury.html
[4] Available online from https://www.paintback.com.au/
[5] Available online from https://businessrecycling.com.au/

Waste Types	NSW EPA Waste Classification	Proposed Management Method
Work Compound and Associated Offices		
Food Waste	General solid (putrescible) waste	Dispose to landfill with general garbage
Recyclable beverage containers, such as glass and plastic bottles, aluminium cans and steel cans	General solid waste (non-putrescible)	Recycling at off-site licensed facility or at NSW container deposit scheme 'Return and Earn' facility[6]
Clean paper and cardboard	General solid waste (non-putrescible)	Paper and cardboard recycling at off-site licensed facility
General domestic waste generated by workers such as soiled paper and cardboard, food and polystyrene	General solid waste (non-putrescible) mixed with putrescible waste	Disposal at landfill

7.3 Demolition Waste Types and Quantities

7.3.1 Demolition Waste Generation Rates

Council's Guidelines do not provide any advice on demolition waste quantities.

As an alternative, SLR has adopted the 'Factory' waste generation rates from Appendix A of The Hills' Development Control Plan for estimating the type and quantities of waste generated from demolition of the proposed buildings. We have also referred to Light Duty Asphalt Pavements - Design, Specification and Construction 2002 published by the Australian Asphalt Pavement Association in calculating car park waste demolition quantities.

The demolition waste generation rates used are shown in Table 6 below.

Table 4 Demolition waste generation rates

Rate Type	Area (m^2)	Waste types and quantities (m^3)						
		Timber/ Gyprock	Concrete	Bricks	Metal	Other	Asphalt	Granular Base
Factory	1,000	4	448	205	23	18		
Carpark	1,000	0	22.5[7]	0	0	0	30[8]	125[9]

7.3.2 Buildings for Demolition

The current site layout with boundary and buildings labelled is shown in Figure 4 below.

[6]Available online from http://returnandearn.org.au/
[7] Estimate of kerb profile
[8] 30 mm depth for passenger car parking areas of this size. Light Duty Asphalt Pavements - Design, Specification and Construction 2002 Australian Asphalt Pavement Association. Table 10 Passenger Car Parking Areas, 50-500 Bays
[9] 125 mm depth for passenger car parking areas of this size. Light Duty Asphalt Pavements - Design, Specification and Construction 2002 Australian Asphalt Pavement Association. Table 10 Passenger Car Parking Areas, 50-500 Bays

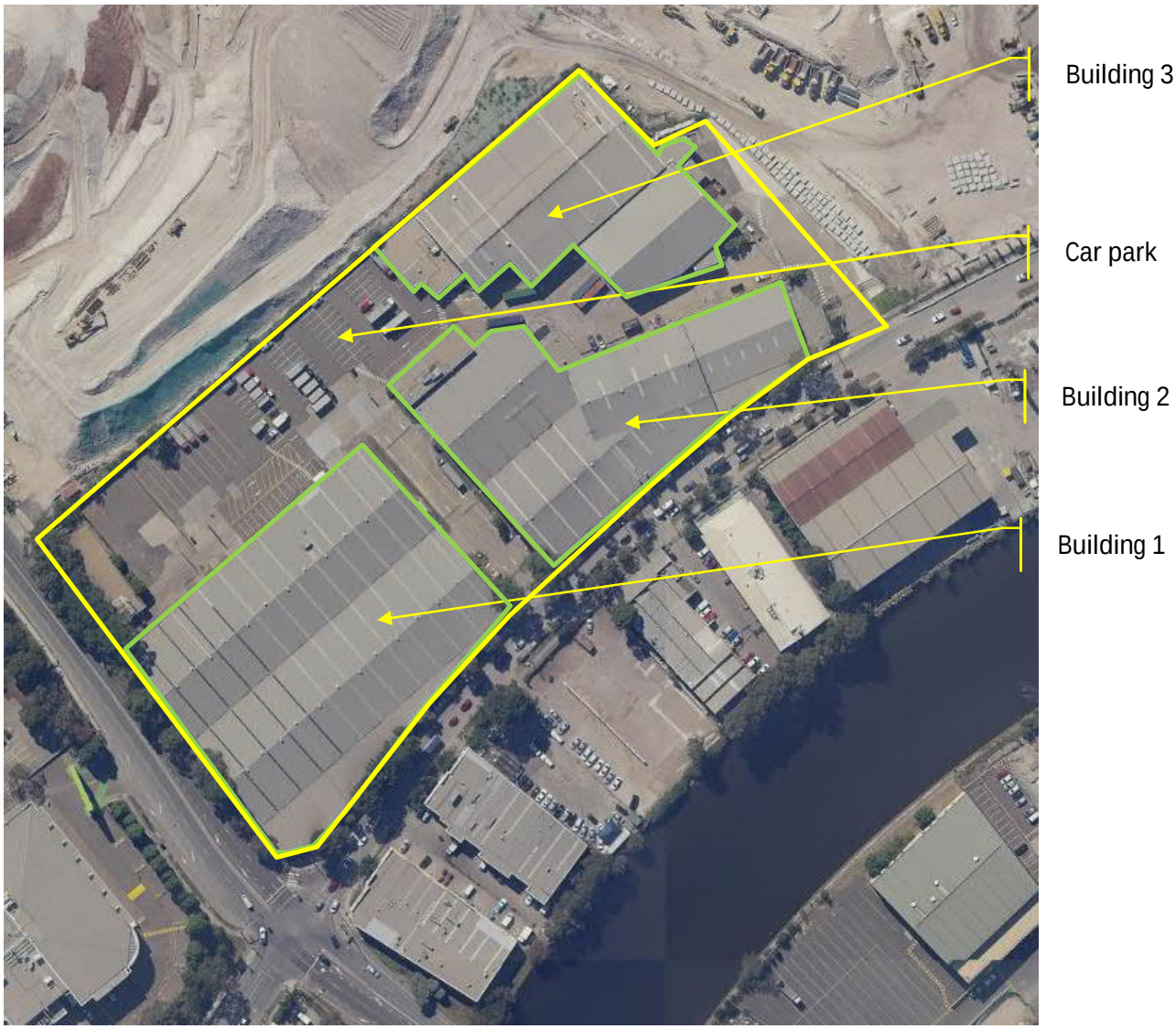

Figure 4 Current site layout

Images from Six Maps and Google Earth show that the buildings are primarily brick construction with bonded metal rooves. The image from SixMaps (Figure 4) has been used to calculate the areas of each building and car parking areas. These areas are shown in Table 7 along with estimates of the quantities of demolition waste that may be generated.

Table 5 Estimated types and quantities of demolition waste

Building	Footprint (m^2)	Waste types and quantities (m^3)						
		Timber/ Gyprock	Concrete	Bricks	Metal	Other	Asphalt	Granular Base
Building 1	9,382	38	4,203	1,923	216	169	-	-
Building 2	6,599	26	2,956	1,353	152	119	-	-
Building 3	5,085	20	2,278	1,042	117	92	-	-
Hardstand	6,171	-	1,851	-	370	309	-	-
Carpark	5,577	-	125	-	-	-	167	697
Total	32,814	84	11,414	4,319	855	688	167	697

7.4 Construction Waste Types and Quantities

Council's Guidelines do not provide any advice on construction waste quantities. As an alternative, SLR has adopted the 'Factory' and 'Office' waste generation rates from Appendix A of The Hills' Development Control Plan for estimating the type and quantities of waste generated from construction of the proposed buildings. The construction waste generation rates used are shown in Table 6 below.

Table 6 Construction waste generation rates

Rate Type	Area (m^2)	Waste types and quantities (m^3)						
		Timber	Concrete	Bricks	Gyprock	Sand or Soil	Metal	Other
Factory	1,000	0.25	2.1	1.65	0.45	4.8	0.6	0.5
Office	1,000	5.1	18.8	8.5	8.6	8.8	2.75	5
Hardstand, carpark and ramps	1,000		2.1			4.8	0.6	0.5

The areas shown in Table 7 are based on the areas for the Development shown in 2213A 221102 1-3 Burrows Road SSDA Issue Rev D.pdf.

Estimates of the quantities of construction waste generated from the Development are shown in Table 7 below.

Table 7 Estimated types and quantities of construction waste

Development Component	Area (m^2)	Waste types and quantities (m^3)						
		Timber	Concrete	Bricks	Gyprock	Sand or Soil	Metal	Other
Warehouses	46,900	117	985	774	211	2,251	281	235
Hardstand, carpark and ramps	34,412	0	723	0	0	1,652	206	172
Office Building	5,020	13	105	83	23	241	30	25
Total	86,332	130	1,813	857	234	4,144	518	432

7.5 Waste Avoidance Strategies

The Building Contractor, Building Designer and/or those in equivalent roles should follow better practice waste management and the principles of Ecologically Sustainable Development.

Recommendations for the Building Designer include:

- Using prefabricated components
- Using low formaldehyde wood products, post-consumer reused timber and/or Forest Stewardship Council certified timber
- Using fittings and furnishings that have been recycled, are made from or incorporate recycled materials and have been certified as sustainable or environmentally friendly by a recognised third-party certification scheme
- Preferentially using building materials, fittings and furnishings, including structural framing, roofing and façade cladding, that have longer life and better re-use and recycling potential
- Reducing the use of polyvinyl chloride products
- Preferentially using paints, floor coverings and adhesives with low VOC (volatile organic compound) content

- Avoiding unsustainable timber imports including western red cedar, oregon, meranti, luan or merbau
- Selecting materials based on low embodied energy properties that suit the Project, such as recycled materials including recycled steel and glass-wool insulation, or concrete with slag and fly ash content
- Centralising wet areas together to minimise piping, and
- Designing for deconstruction rather than demolition.

Recommendations for the Building Contractor include:

- Applying practical building designs and construction techniques
- Minimising excavation works
- Investigating leased equipment and machinery rather than purchase and disposal
- Sorting and segregating site preparation and construction wastes to ensure efficient recycling of wastes
- Preferentially selecting building materials, fittings and furnishings, including structural framing, roofing and façade cladding, that have longer life and better re-use and recycling potential
- Store wastes on-site appropriately to prevent cross-contamination and/or mixing of different waste types
- Reducing packaging waste by:
  - Returning packaging to suppliers where practicable to reduce waste further along the supply chain
  - Purchasing in bulk
  - Requesting cardboard or metal drums rather than plastics
  - Requesting metal straps rather than shrink wrap, and
  - Using returnable packaging such as pallets and reels.
- Arranging deliveries ‘as needed’ to mitigate degradation, weathering or moisture damage, and
- Ensure subcontractors are informed of and implement site waste minimisation and management procedures.

7.6 Re-use, Recycling and Disposal

Effective management of construction materials and waste, including options for reuse and recycling where applicable and practicable, will be conducted. Only waste that cannot be cost effectively reused or recycled is to be sent to landfill or appropriate disposal facilities.

Refer Table 3 for an outline of the proposed reuse, recycling and disposal methods for potential waste streams generated by the development.

The following specific procedures should be implemented:

- concrete, tiles and bricks should be reused or recycled off-site
- steel should be recycled off-site, and all other metals should be recycled where economically viable
- framing timber should be reused on-site or recycled off-site
- windows, doors and joinery should be recycled off-site, where possible

- all used crates should be stored for reuse unless damaged
- all glass that can be economically recycled should be recycled
- all solid waste timber, brick, concrete, rock that cannot be reused or recycled should be taken to an appropriate facility for treatment to recover further resources or for disposal to landfill in an approved manner
- all asbestos, hazardous and/or intractable wastes should be disposed of in accordance with SafeWork NSW and NSW EPA requirements
- provision for the collection of batteries, fluorescent tubes, smoke detectors and other recyclable resources should be provided on site, and
- all waste and recycling should be disposed of through a council approved system.

7.7 Waste Separation, Storage and Servicing

7.7.1 Waste Separation and Storage

Waste materials produced from demolition and construction activities will be separated at the source and stored separately on-site. A more detailed construction waste management plan will be prepared that will provide further information on waste storage on site during construction.

It is anticipated that there will be enough space on-site for separate storage in, for example, separate skip bins or appropriately managed stockpiles, of the following waste types:

- Bricks, concrete and scrap metal
- Metal and steel, in a condition suitable for recycling at metal recycling facilities
- Timber
- Glass
- Hardstand rubble
- Uncontaminated excavation spoil, if present
- Contaminated excavation spoil, if present
- Hazardous waste, if present
- Paper and cardboard
- General co-mingled recycling waste, and
- Non-recyclable general waste.

If there is insufficient space on-site for full separation of waste types, the site manager, or equivalent role, should consult with the waste and recycling collection contractor to confirm which waste types may be co-mingled before removal from the site.

7.7.2 Waste Storage Areas

Waste storage areas will be accessible and allow sufficient space for storage and servicing requirements. The storage areas will also be flexible in order to cater for change of use throughout the project. Where space is restricted, dedicated stockpile areas will be delineated on the site, with regular transfers to dedicated skip bins for sorting.

All waste placed in skips or bins for disposal or recycling will be adequately contained to ensure that waste does not fall, blow, wash or otherwise escape from the site. Waste containers and storage areas will be kept clean and in a good state of repair.

Applicable weather protection measures should be considered for storage spaces.

In accordance with good practice waste management, areas designated for waste storage will:

- Allow unimpeded access by site personnel and waste disposal contractors
- Take into account environmental factors which could potentially cause an impact to the waste storage, such as slope, drainage and the location of watercourses and native vegetation
- Allow sufficient space for the storage of garden waste and other waste materials on-site
- Employ adequate environmental management controls to prevent off-site migration of waste materials and contamination from the waste. For example, consideration of slope, drainage, proximity relative to waterways, stormwater outlets and vegetation
- Consider visual amenity, safety and accessibility in their selection, and
- Not present hazards to human health or the environment.

7.7.3 Waste Servicing and Record Keeping

The Site Manager or equivalent role will:

- Arrange for suitable waste collection contractors to remove any construction waste from site
- Ensure waste bins are not filled beyond recommended filling levels
- Ensure that all bins and loads of waste materials leaving site are covered
- Maintain waste disposal documentation detailing, at a minimum:
  - Descriptions and estimated amounts of all waste materials removed from site
  - Details of the waste and recycling collection contractors and facilities receiving the waste and recyclables
  - Records of waste and recycling collection vehicle movements, for example, date and time of loads removed, licence plate of collection vehicles, tip dockets from receiving facility, and
  - Waste classification documentation for materials disposed to off-site recycling or landfill facilities.
- Ensure lawful waste disposal records are readily accessible for inspection by regulatory authorities such as Council, SafeWork NSW or NSW EPA, and
- Remove waste during approved hours.

If skips and bins are reaching capacity, removal and replacement will be organised as soon as possible. All site-generated building waste collected in the skips and bins will leave the site and taken to a site lawfully able to accept them.

7.7.4 Waste Servicing and Transport

The frequency of the waste removal will, in most cases, be dictated by the quantities of material being deposited into each of the dedicated skip bins. All skips leaving the site will be covered with a suitable tarpaulin to ensure that the spillage of waste from the skips while in transit is eliminated.

7.8 Signage

Standard signage will be posted in all waste storage and collection areas. All waste containers will be labelled correctly and clearly to identify stored materials.

Signs approved by the NSW EPA for labelling of waste materials are available online[10] and should be used where applicable. A selection of the EPA's signs is shown in Figure 5.

Figure 5 Examples of NSW EPA labels for waste and skip bins

7.9 Site Inductions

All staff, including sub-contractors and labourers, employed during the site preparation and construction phases of the Development will undergo induction training regarding waste management.

Induction training will cover, as a minimum, an outline of the WMP including:

- Legal obligations and targets
- Emergency response procedures on-site
- Waste priorities and opportunities for reduction, reuse and recycling
- Waste storage locations and separation of waste
- Procedures for suspected contaminated and hazardous wastes

[10] NSW EPA approved waste materials signage https://www.epa.nsw.gov.au/your-environment/recycling-and-reuse/business-government-recycling/standard-recycling-signs

- Waste related signage
- The implications of poor waste management practices, and
- Responsibilities and reporting, including identification of personnel responsible for waste management and individual responsibilities.

7.10 Monitoring and Reporting

During the demolition and construction phases, the following monitoring practices will be undertaken to improve demolition and construction waste management and to obtain accurate waste generation figures:

- Conduct waste audits of current projects where feasible.
- Note waste generated and disposal methods.
- Look at past waste disposal receipts.
- Record this information to track waste avoidance, reuse and recycling performance and to help in waste estimations for future waste management plans.

Records will be maintained for all waste quantities that are recycled, reused or removed by a contractor. All demolition and construction waste dockets will be kept which show which facility received the material for recycling or disposal.

Daily visual inspections of waste storage areas will be undertaken by site personnel and inspection checklists and logs recorded for reporting to the site manager or equivalent role on a weekly basis or as required. These inspections will be used to identify and rectify any resource and waste management issues.

Waste audits should be carried out by the building contractor or equivalent role to gauge the effectiveness and efficiency of waste segregation procedures and recycling and reuse initiatives. Where audits show that the above procedures are not carried out effectively, additional staff training will be undertaken and signage will be re-examined.

7.11 Roles and Responsibilities

All personnel have a responsibility for their own environmental performance and compliance with all legislation. It will be the responsibility of the site manager, or equivalent role, to implement the WMP, and the responsibility of employees and subcontractors to ensure that they comply with the WMP at all times.

Suggested roles and responsibilities for waste management at the site are provided in Table 8. Where possible, a construction environmental manager, or equivalent role, should be appointed for the site preparation and construction work. An equivalent construction environmental manager role is defined to be a person dedicated to overseeing the environmental compliance and performance of a development. Where a construction environmental manager is not appointed, responsibilities in Table 8 for the construction environmental manager will become those of the site manager.

Table 8 Suggested roles and responsibilities for site preparation, demolition and construction waste management

Role	Responsibilities
Site Manager	• Ensuring plant and equipment are well maintained • Ordering only the required amount of materials • Keeping materials segregated to maximise reuse and recycling • Ensuring that waste sorting and storage areas are maintained in a tidy and functional state and do no present hazards to human health or the environment • Ensure hazardous or contaminated materials are appropriately managed and disposed • Ensure site records and documentation is kept and is complete • Ensure this WMP are implemented, and • Liaise with Council and regulatory authorities as required.
Construction Environmental Manager or equivalent	• Ensuring staff and contractors are aware of site requirements for waste management • Establishing separate skips and stockpiles and recycling bins for effective waste segregation and recycling purposes • Developing or identifying, and using, local commercial opportunities for re-use of materials where re-use on-site is impractical • Facilitate correct waste collection • Engage suitable waste collection and disposal contractors • Approval of off-site waste disposal locations and checking licensing requirements • Arranging for the assessment of potentially hazardous or contaminated materials • Arranging for appropriate contaminated waste management and approval of off-site waste transport, disposal locations and checking licensing requirements • Monitor and maintain site environmental controls and • Monitoring, inspection and reporting requirements.

8 Operational Waste and Recycling Management

8.1 Targets for Resource Recovery

Targets for new development are expected to contribute to state-specific targets. The NSW Waste and Sustainable Materials Strategy 2041 (DPIE, 2021) sets a target of 80% average recovery rate from all waste streams by 2030. Analysis by DPIE (2021) indicates that the commercial and industrial waste recovery rate in 2019 was 53%.

It is anticipated that the waste minimisation measures in the following sections will assist the Development to achieve this recycling rate. Waste reporting and audits can be used to determine the actual percentage of wastes that are being or have been recycled during operation.

8.2 City of Sydney Requirements

Requirements for waste management in new developments in the City of Sydney are covered in Council's Guidelines for Waste Management in New Developments (2018). These guidelines have been used to guide waste quantities and waste management at the Development.

8.2.1 General

The Guidelines require that a waste management plan be prepared for this development. The plan must show:

- On drawings, the location and space allocated to the waste management systems and facilities and the nominated waste collection point for the site
- Details of the types and quantities of waste streams
- Access paths for users and collection vehicles
- Sufficient, dedicated space to collect and recycle food waste in kitchens, office tearooms, and service and food preparation areas
- Details of ongoing management, storage and collection of waste, including responsibility for cleaning, transfer of bins between storage areas and collection points, implementation and maintenance of signage, and security of storage areas
- Where appropriate, a summary document for tenants and residents to inform them of the building's waste management arrangements
- Details of the handling of construction, demolition and ongoing waste outputs of the development.

The Guidelines also specify that:

- The maximum manual handling distance between the storage room and the collection point is 10 m for 120 L, 240 L, 660 L and 1,100 L mobile bins
- The collection point is to be located where the waste or recycling collection vehicles can stand safely

Other specifications that are relevant to this development are detailed below.

8.2.2 Industrial

Section D Non-residential developments, covers provisions for waste and recycling management in industrial and commercial developments

- All collection of non-residential waste is to be conducted on-site. Consideration will be given to smaller developments where this is not possible
- Waste collection points should be located wholly within the boundary of the development and in an area that minimises noise or odour impacts on nearby premises
- Space should be provided for the storage of food waste for collection. The space should be dedicated and in, or attached to, the waste storage area
- Space should be provided for the separate collection of beverage containers that comply with the NSW Container Deposit Scheme.
- A separate dedicated space such as a room, or a screened area in, or attached to, the waste and recycling storage area, is to be provided for storing bulky waste and problem waste for collection. For developments between 100 m^2 and 2,000 m^2, 4 m^2 must be provided with an additional 4 m^2 for each development over 2,000 m^2 and for every 20,000 m^2 of office space

- A separate dedicated space, such as a room or screened area, should be provided for the separate interim storage and management of stripout waste for re-use or recycling. This space is not required if the removal of old furniture and material is conducted by a professional stripout service or by the company hired for installing new items.
- Secure space is to be allocated for the separate storage of liquid wastes, commercial cleaning products, chemicals, paints, solvents, and motor and cooking oil. These areas should be bunded, and drained to a grease trap, in accordance with legislation and the requirements of State government authorities and agencies
- Commercial waste collection vehicle specifications should be matched to Council waste collection vehicle specifications as set out in Reference C of the Guidelines, Design requirements for collection vehicle access.

8.2.3 Commercial

- Provision is to be made on each floor, and in the waste and recycling storage area or any interim holding area, for the separation and storage of all recyclable items, including mixed containers, cardboard, paper and paper products, likely to be produced from the premises.
- Paper and cardboard must be stored in a dry, vermin-proof area.

8.2.4 Reference C Design requirements for collection vehicle access

Waste collection vehicles may be side loading, rear loading or front-end loading. The size of vehicle varies according to the collection service.

Vehicle access and turning requirements

A turning path analysis will be used to check:

- that the paths of vehicles travelling in the forward direction when negotiating access driveways and circulation roadways, can be accommodated within the proposed location
- the movement out of a loading dock to establish that sufficient width is provided for the vehicle swept path, including manoeuvring clearances.

Turning path analysis will include:

- Details of road geometry, details dimension of the driveway, width of the road (carriage way), footpath, kerb and gutter, median and on-street parking where applicable.
- Dimension details of the design vehicle
- Turning radius and operable speed
- Lock to lock time. It is recommended that a value between three and six seconds is reasonable for most conventional vehicles. It should come through a vehicle data sheet, however, if not a six seconds should be chosen.
- Three clear swept paths line namely wheel path, vehicle body path and 0.6 m clearance path.

The parameter of the design vehicle for swept path analysis should be obtained from the manufacturer specification with reference or the parameters in the vehicle dimension table can be used.

Best design practice for access and egress from a development calls for a separate entrance and exit to allow the collection vehicle to travel in a forward direction at all times.

The design aspects take into account:

- Placement of waste and recycling bins in a common collection area
- The presence of parked cars on access roads
- Trucks are to only be expected to make a three-point turn to complete a U-turn
- Allowing for collection vehicle overhang and possible interference with bins and road furniture.

Road geometry

The design parameters will comply with the following road geometry:

- A maximum desirable gradient of 10 per cent for turning heads
- Vehicle access for collection and loading will provide for a maximum grade of 1:20 for the first 6 m from the street, then a maximum of 1:8 with a transition of 1:12 for 4 m at the lower end
- A maximum longitudinal road gradient of 15 per cent
- A minimum kerb radius of 8.5 m at the outside of the turn where there is to be on-site collection
- A minimum pavement width of 6.5 m if 25 or more parking spaces for cars are required. Use of passing bays is acceptable
- An industrial-type strength pavement designed for a maximum wheel loading of 7 t per axle in order to accommodate waste and recycling collection trucks. The standard road pavement design specifications for an individual driveway entry on public land is 150 mm thick concrete, 20 MPa concrete with F82 mesh.

8.3 Waste Streams and Classifications

The operation of the Development is likely to generate the following broad waste streams:

- Domestic type waste generated by employees, including food waste
- Bulk packaging waste, including polystyrene, plastic wrapping and cardboard boxes
- Office waste
- Garden organic waste from landscaped areas
- Bulky waste items such as furniture and e-waste.

Potential waste types, their associated waste classifications, and management methods are provided in Table 9. For further information on how to determine a waste's classification, refer to the NSW EPA (2014) Waste Classification Guidelines[11]. Recycling drop off locations and contacts can be found on https://businessrecycling.com.au/ for each waste type.

[11] Available online from https://www.epa.nsw.gov.au/your-environment/waste/classifying-waste/waste-classification-guidelines

Table 9 Potential waste types, classifications and management methods for operational waste

Waste Types	NSW EPA Classification	Proposed Management Method
Clean office paper	General solid (non-putrescible) waste	Paper recycling at off-site licensed facility
Cardboard including bulky cardboard boxes	General solid (non-putrescible) waste	Cardboard recycling at off-site licensed facility
Recyclable beverage containers, glass and plastic bottles, aluminium cans, steel cans	General solid (non-putrescible) waste	NSW container deposit scheme 'Return and Earn'; container recycling at off-site licensed facility
Food waste	General solid (putrescible) waste	Donate, if suitable, alternatively compost on or off-site or dispose to landfill with general garbage
Batteries	Hazardous waste	Off-site recycling; alternatively contact the Australian Battery Recycling Initiative for more information
Mobile Phones	Hazardous waste	Off-site recycling; can be taken to several locations through the Mobile Muster program. Contact Mobile Muster for more information
Bulky polystyrene	General solid (non-putrescible) waste	Off-site recycling or disposal at landfill
Furniture	General solid (non-putrescible) waste	Off-site reuse or disposal to landfill
E-waste	Hazardous waste	Off-site recycling
Printer toners and ink cartridges	Hazardous waste	Off-site recycling, free disposal box or bags and pickup service exists for printer toners and ink cartridges
Packaging materials, including wood, plastic, including stretch wrap or LDPE, cardboard and metals	General solid waste (non-putrescible)	Off-site recycling
Wooden or plastic crates and pallets	General solid waste (non-putrescible)	Reused for similar projects, returned to suppliers, or off-site recycling.
Sanitary waste, nappies	General solid (putrescible) waste	Contractor disposal at licensed facility
General garbage, including non-recyclable plastics	General solid (putrescible and non-putrescible) waste	Disposal at landfill
Spent smoke detectors[12]	General solid (non-putrescible) waste, or Hazardous waste (some commercial varieties)	Disposal to landfill, or off-site disposal at licensed facility
Glass, other than containers	General solid (non-putrescible) waste	Off-site recycling
Light bulbs and fluorescent tubes	Hazardous waste	Off-site recycling or disposal, contact FluoroCycle for more information
Air-conditioning parts and filters	General solid (non-putrescible) waste	Off-site recycling or disposal to landfill

[12] The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) require that when more than 10 smoke alarms (particularly americium-241 sources) are collected for bulk disposal they must be treated as radioactive waste and the requirements of the National Health and Medical Research Council's Code of practice for the near-surface disposal of radioactive waste in Australia (1992) must be met.

Waste Types	NSW EPA Classification	Proposed Management Method
Garden organics - lawn mowing, tree branches, hedge cuttings, leaves	General solid (non-putrescible) waste	Reuse on-site or contractor removal for recycling at licenced facility

8.4 Waste quantities

The Guidelines provide waste generation rates for commercial offices, but no waste generation rates for warehouses, nor does the NSW EPA's Better Practice Guidelines for Waste Management and Recycling in Commercial and Industrial Facilities. SLR has, therefore adopted the rates for warehouses from the Penrith DCP.

The operational waste generation rates used are shown below in Table 10.

Table 10 Operational waste generation rates

Type of Premises	Rates Source	Waste generation rates (L/100 m²/day)		
		General Waste	Recycling	Food
Warehouse	Penrith DCP	10	10	
Commercial offices	City of Sydney Guidelines	15	25	5

Using the waste generation rates in Table 10 above, the approximate weekly waste quantities for the Development have been calculated based on the following assumptions:

- The floor areas estimated from the drawings 2213A 221102 1-3 Burrows Road SSDA Issue Rev D.pdf.
- The proportions of paper and cardboard in the recycling stream in offices is 93% and the proportion of recyclable containers is 7%[13]
- A week is seven days per week.

Warehouse waste quantities are shown in Table 11 below.

Table 11 Estimated quantities of warehouse operational waste and recycling

Level	Warehouse Number	Total GFA (m²)	Waste Generation (L per 100 m² per day)		Quantities per day (L)		Days per week	Quantities per week (L)	
			Garbage	Recycling	Garbage	Recycling		Garbage	Recycling
Ground	0-01	2,590	10	10	259	259	7	1,813	1,813
Ground	0-02	2,275	10	10	228	228	7	1,593	1,593
Ground	0-03	2,023	10	10	202	202	7	1,416	1,416
Ground	0-04	1,574	10	10	157	157	7	1,102	1,102
Ground	0-05	880	10	10	88	88	7	616	616
Ground	0-06	827	10	10	83	83	7	579	579
Ground	0-07	806	10	10	81	81	7	564	564
Ground	0-08	827	10	10	83	83	7	579	579
Ground	0-09	1,231	10	10	123	123	7	862	862

[13] Industry fact sheets - Commercial offices EPA 2012/0341 November 2012 ISBN 978-1-74293-876-9

Level	Warehouse Number	Total GFA (m²)	Waste Generation (L per 100 m² per day)		Quantities per day (L)		Days per week	Quantities per week (L)	
			Garbage	Recycling	Garbage	Recycling		Garbage	Recycling
Ground	0-10	1,440	10	10	144	144	7	1,008	1,008
Level 1	1-01	2,567	10	10	257	257	7	1,797	1,797
Level 1	1-02	2,278	10	10	228	228	7	1,595	1,595
Level 1	1-03	2,000	10	10	200	200	7	1,400	1,400
Level 1	1-04	1,600	10	10	160	160	7	1,120	1,120
Level 1	1-05	863	10	10	86	86	7	604	604
Level 1	1-06	822	10	10	82	82	7	575	575
Level 1	1-07	808	10	10	81	81	7	566	566
Level 1	1-08	817	10	10	82	82	7	572	572
Level 1	1-09	1,222	10	10	122	122	7	855	855
Level 1	1-10	1,440	10	10	144	144	7	1,008	1,008
Level 2	2-01	2,613	10	10	261	261	7	1,829	1,829
Level 2	2-02	2,268	10	10	227	227	7	1,588	1,588
Level 2	2-03	2,000	10	10	200	200	7	1,400	1,400
Level 2	2-04	1,600	10	10	160	160	7	1,120	1,120
Level 2	2-05	837	10	10	84	84	7	586	586
Level 2	2-06	810	10	10	81	81	7	567	567
Level 2	2-07	800	10	10	80	80	7	560	560
Level 2	2-08	810	10	10	81	81	7	567	567
Level 2	2-09	1,230	10	10	123	123	7	861	861
Level 2	2-10	1,460	10	10	146	146	7	1,022	1,022
Total		43,318			4,332	4,332		30,323	30,323

Office waste quantities are shown in Table 12 below.

Table 12 Estimated quantities of office operational waste and recycling

Level	Total GFA (m²)	Quantities per day (L)				Days per Week	Quantities per week (L)			
		Garbage	Food	Paper and Cardboard	Recyclable Containers		Garbage	Food	Paper and Cardboard	Recyclable Containers
Ground	430	65	22	100	2	7	452	151	700	11
Level 1	1,115	167	56	259	4	7	1,171	390	1,815	27
Level 2	1,115	167	56	259	4	7	1,171	390	1,815	27
Total	2,660	399	133	618	9		2,793	931	4,329	65

8.5 Waste storage areas sizes

8.5.1 Bulky Waste

The Guidelines state that for developments between 100 m^2 and 2,000 m^2, 4 m^2 must be provided with an additional 4 m^2 for each development over 2,000 m^2 and for every 20,000 m^2 of office space.

Twenty-one units have less than 2000 m^2, so each should have 4 m^2 of bulky waste storage space. Nine units have more than 2000 m^2 so 8 m^2 of bulky waste storage space should be allowed for those. This is shown in Table 13.

8.5.2 Bins

Warehouse

The areas required for the waste storage rooms take into account bin sizes, numbers and additional space for easy and safe movement of bins. Given the estimated quantities of waste, 1,100 L rear lift bins are a suitable option and these have been included in the waste storage area calculations.

Table 13 below shows estimates for the number of bins and minimum storage areas for operational waste and recycling for individual units.

Table 13 Recommended minimum bins, collections, and storage areas for individual warehouse units

Level	Warehouse Number	Total GFA (m^2)	Bin Capacity	Garbage Services Per Week	Recycling Services Per Week	Number of Garbage Bins	Number of Recycling Bins	Total Number of Bins	Storage Area Required (m^2)				Bulky Waste	Total Waste Storage
									Garbage	Recycling	Total	Including Manoeuvring		
Ground	0-01	2,590	1100 L	2	2	1	1	2	1.7	1.7	3.4	6.8	8.0	14.8
Ground	0-02	2,275	1100 L	2	2	1	1	2	1.7	1.7	3.4	6.8	8.0	14.8
Ground	0-03	2,023	1100 L	2	2	1	1	2	1.7	1.7	3.4	6.8	8.0	14.8
Ground	0-04	1,574	1100 L	2	2	1	1	2	1.7	1.7	3.4	6.8	4.0	10.8
Ground	0-05	880	1100 L	1	1	1	1	2	1.7	1.7	3.4	6.8	4.0	10.8
Ground	0-06	827	1100 L	1	1	1	1	2	1.7	1.7	3.4	6.8	4.0	10.8
Ground	0-07	806	1100 L	1	1	1	1	2	1.7	1.7	3.4	6.8	8.0	10.8
Ground	0-08	827	1100 L	1	1	1	1	2	1.7	1.7	3.4	6.8	4.0	10.8
Ground	0-09	1,231	1100 L	1	1	1	1	2	1.7	1.7	3.4	6.8	4.0	10.8
Ground	0-10	1,440	1100 L	1	1	1	1	2	1.7	1.7	3.4	6.8	4.0	10.8
Level 1	1-01	2,567	1100 L	2	2	1	1	2	1.7	1.7	3.4	6.8	8.0	14.8
Level 1	1-02	2,278	1100 L	2	2	1	1	2	1.7	1.7	3.4	6.8	8.0	14.8
Level 1	1-03	2,000	1100 L	2	2	1	1	2	1.7	1.7	3.4	6.8	8.0	14.8
Level 1	1-04	1,600	1100 L	2	2	1	1	2	1.7	1.7	3.4	6.8	4.0	10.8
Level 1	1-05	863	1100 L	1	1	1	1	2	1.7	1.7	3.4	6.8	4.0	10.8
Level 1	1-06	822	1100 L	1	1	1	1	2	1.7	1.7	3.4	6.8	4.0	10.8

Level	Warehouse Number	Total GFA (m²)	Bin Capacity	Garbage Services Per Week	Recycling Services Per Week	Number of Garbage Bins	Number of Recycling Bins	Total Number of Bins	Storage Area Required (m²)				Bulky Waste	Total Waste Storage
									Garbage	Recycling	Total	Including Manoeuvring		
Level 1	1-07	808	1100 L	1	1	1	1	2	1.7	1.7	3.4	6.8	4.0	10.8
Level 1	1-08	817	1100 L	1	1	1	1	2	1.7	1.7	3.4	6.8	4.0	10.8
Level 1	1-09	1,222	1100 L	1	1	1	1	2	1.7	1.7	3.4	6.8	4.0	10.8
Level 1	1-10	1,440	1100 L	1	1	1	1	2	1.7	1.7	3.4	6.8	4.0	10.8
Level 2	2-01	2,613	1100 L	2	2	1	1	2	1.7	1.7	3.4	6.8	8.0	14.8
Level 2	2-02	2,268	1100 L	2	2	1	1	2	1.7	1.7	3.4	6.8	8.0	14.8
Level 2	2-03	2,000	1100 L	2	2	1	1	2	1.7	1.7	3.4	6.8	8.0	14.8
Level 2	2-04	1,600	1100 L	2	2	1	1	2	1.7	1.7	3.4	6.8	4.0	10.8
Level 2	2-05	837	1100 L	1	1	1	1	2	1.7	1.7	3.4	6.8	4.0	10.8
Level 2	2-06	810	1100 L	1	1	1	1	2	1.7	1.7	3.4	6.8	4.0	10.8
Level 2	2-07	800	1100 L	1	1	1	1	2	1.7	1.7	3.4	6.8	4.0	10.8
Level 2	2-08	810	1100 L	1	1	1	1	2	1.7	1.7	3.4	6.8	4.0	10.8
Level 2	2-09	1,230	1100 L	1	1	1	1	2	1.7	1.7	3.4	6.8	4.0	10.8
Level 2	2-10	1,460	1100 L	1	1	1	1	2	1.7	1.7	3.4	6.8	4.0	10.8

8.5.3 Office

The areas required for the waste storage rooms take into account bin sizes, numbers and additional space for easy and safe movement of bins. Given the estimated quantities of waste, 240 L bins for garbage, paper and cardboard and recyclables containers are a suitable option and these have been included in the waste storage area calculations. Food waste is proposed to be collected in 120 L bins.

Table 14 below shows estimates for the number of bins and minimum storage areas for operational waste and recycling for the office area.

Table 14 Recommended minimum bins, collections, and storage areas for offices

Use	Total GFA (m²)	Bin Capacity (L)		Services Per Week				Number of Bins					Storage Area Required (m²)							
		Garbage. Paper and Cardboard, Recyclable Containers	Food	Garbage	Food	Paper and Cardboard	Recyclable Containers	Garbage	Food	Paper and Cardboard	Recyclable Containers	Total	Garbage	Food	Paper and Cardboard	Recyclable Containers	Total	Including Manoeuvring	Bulky Waste	Total Waste Storage
Office	5,019	240	120	5	7	5	1	5	2	3	1	11	2.1	0.5	1.3	0.4	4.4	8.8	8	16.8

The drawings show a waste storage area for the offices on level L0. This has an area of about 28 m^2 which is adequate for the amount of waste estimated to be generated.

8.6 Waste Storage Area Locations

Figure 6 below shows potential locations of waste storage areas on one level of the warehouse and the indicated location of the office waste storage area. The areas are approximately to scale. The warehouse waste storage areas are at the front of each unit so that bins can be easily wheeled outside for collection.

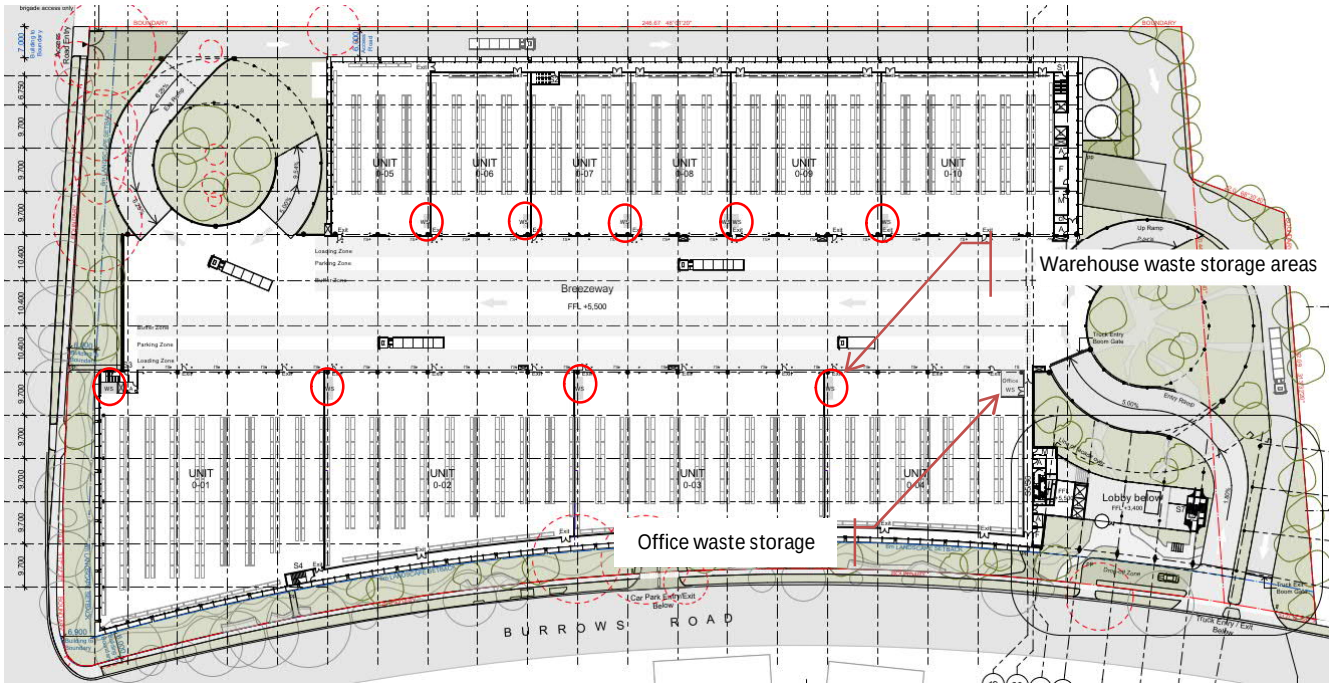

Figure 6 Locations of waste storage areas

8.7 Waste System Description

Tenants will store bins inside their premises near the front roller doors. Waste will be separated and placed in bins for each stream in their storage location. Waste collection vehicles will enter the site through the heavy vehicle entrance and drive to each tenancy. They will stop outside each tenancy and tenancy staff or waste collection contractor operators will bring bins from their storage location to the vehicle for emptying. The carting distance will be less than 10 m in each case and will be free of gradients, kerbs and steps. Waste collection vehicles will then exit the site through the heavy vehicles exit.

Please refer to the separate traffic management plan.

8.8 Litter Control

Bins will be stored within each warehouse behind rollers doors in purpose-designed bins with close fitting hingers. No litter is expected to be generated during storage. There is some potential for litter to be generated during collection. An operational waste management plan, yet to be prepared will provide more details on the practices to be implemented for the minimisation of litter generation and confinement of litter.

8.9 Waste Vehicle Access

The following access provisions will apply for collections:

- Collection vehicles will be able to enter and exit the site in a forward direction
- Unobstructed access, adequate driveways and ramps of sufficient strength to support waste collection vehicle have been allowed for.

8.10 Waste Avoidance, Reuse and Recycling

8.10.1 Waste avoidance

Waste avoidance measures include:

- Returning packaging materials like cardboard to the suppliers through the services of the supplier delivery trucks, allowing the reduction of waste further along the supply chain
- Providing ceramic cups, mugs, crockery and cutlery rather than disposable items
- Bulk purchasing and the purchasing of items that use minimal packaging
- Presenting all waste reduction initiatives to staff and tenants as part of their induction program, and
- Leasing equipment and machinery rather than outright purchase and disposal.

8.10.2 Re-use

Possible re-use opportunities include establishing systems with in-house and supply chain stakeholders to transport products in re-useable packaging where possible.

8.10.3 Recycling

Recycling opportunities include:

- Collecting and recycling e-wastes
- Printer toners and ink cartridges, if purchased, are collected in allocated bins for appropriate contractor recycling
- Paper recycling trays provided in communal and staff areas for scrap paper collection and recycling
- Providing separate receptacles for general waste, recycling and paper and cardboard throughout public areas, as well as within staff areas, to encourage source-separation of waste streams
- Work with tenants to investigate opportunities for the use of recycled paper bags or reusable bags in place of plastics bags
- Separating, by a reasonable distance, the storage areas for recyclables from the general waste storage areas to avoid cross contamination, and
- Development of ‘buy recycled’ purchasing policy.

8.11 Communication Strategies

Education and communication on waste management initiatives and measures will be regularly and clearly conveyed to staff, cleaners and visitors. Benefits of providing this communication include:

- Improved satisfaction with services
- Increased ability and willingness to participate in recycling
- Improved amenity and safety
- Improved knowledge and awareness through standardisation of services
- Increased awareness or achievement of environmental goals and targets
- Reduced contamination of recyclables stream which can incur a collection contractor penalty fee
- Increased recovery of recyclables and organics material, if implemented, and
- Greater contribution to state-wide targets for waste reduction and resource recovery.

To realise these benefits, the following communications strategies are recommended for the Facilities Manager:

- Use consistent signage and colour coding throughout the Development
- Ensure all staff are informed of correct waste separation and management procedures
- Provide directional signage to show locations and routes to waste storage areas
- Repair signs and labels promptly to avoid a breakdown in communication
- Clearly label general and comingled waste bins to ensure no cross contamination and to identify the types of waste that may be disposed of in each bin, and
- Educate all staff and contractors associated with the Development, ensuring they adhere to this WMP.

8.12 Signage

Signs which clearly identify waste management procedures and provisions to contractors, staff and visitors will be posted at the Development as appropriate.

The design and use of safety signs will comply with Australian Standard AS 1319 Safety Signs for the Occupational Environment and clearly describe the types of materials designated for each bin.

Colour-coded and labelled bin lids are necessary for identifying bins and the Australian Standard AS 4123.7-2006 (R2017) Mobile waste containers Part 7: Colours, markings, and designation requirements provides recommendations for the designated colours for waste bins depending on the type of waste the bins are to receive. The colours that will apply to ongoing waste generated by the Development are:

- Blue: Paper and cardboard
- Yellow: Recyclables (other than paper and cardboard)
- Red: General waste.

All bin signage should also follow the NSW EPA's standard signage.[14]

[14] NSW EPA waste signs/posters http://www.epa.nsw.gov.au/wastetools/signs-posters-symbols.htm

Other key signage considerations include:

- Clear and correct labelling on all waste and recycling bins, indicating the correct type or types of waste that can be placed into a given bin, as shown in Figure 7
- Signposts and directions to location of waste storage areas
- Clear signage in all waste storage areas to instruct users how to correctly separate waste and recycling
- Maintaining a consistent style colour scheme that complies with AS 4123, and a system for signs throughout the Development, and
- Emergency contact information for reporting issues associated with waste or recycling management.

Figure 7 Example NSW EPA labels for ongoing waste

8.13 Roles and Responsibilities

It is the responsibility of the Facilities Manager, or equivalent role, to implement this WMP and a responsibility of all tenants and staff to follow the waste management procedures set out by the WMP. SLR recommends that all subcontractors have the roles and responsibilities of all waste management personnel identified and The Development's waste management system clearly explained. A summary of recommended roles and responsibilities are provided in Table 15.

Suggested roles and responsibilities for site preparation, demolition and construction waste management

Table 15 Suggested operational waste-related roles and responsibilities

Responsible Person	General Tasks
Facilities Manager or equivalent role	Ensure the WMP is implemented throughout the life of the operation.
	Update the WMP as needed to ensure the plan remains applicable to the site.
	Undertake liaison and management of contracted waste and recycling collections with Council, contractors and any relevant authorities.
	Regularly conduct waste audits to review system performance and identify any additional materials that could be recovered.
	Manage any complaints and non-compliances reported through waste audits and other sources.
	Ensure all monitoring and audit results are well documented and conducted as specified in this WMP.
	Conduct regular waste sorting, physical condition and cleanliness inspections of bins, waste storage rooms and all other waste management equipment for functionality, hygiene and safety.
	Organise cleaning and maintenance requirements for waste management equipment as required.

Responsible Person	General Tasks
	Ensure waste and recycling storage rooms are kept tidy.
	Monitor bins to ensure no overfilling occurs and manage unexpected waste quantities to mitigate waste overflow in storage areas
	Ensure effective signage, communication and education is provided to alert visitors, employees, site management staff and cleaners about the provisions of this WMP and waste management equipment use requirements.
	Monitor and maintain signage to ensure it remains clean, clear and applicable.
	Manage ongoing education on correct source separation and waste management at least every three months.
	Ensure that regular cleaning and daily transfer of bins is correctly being undertaken by the cleaners.
	Ensure all waste compactors and balers are maintained and operational.
	Ultimately responsible for the management of all waste management equipment, cleaning requirements, waste transfer and collection arrangements.
Cleaners and caretakers	Transfer general waste, recyclables, cardboard waste and hazardous waste from public spaces to the waste and recycling storage areas on a daily basis or as required.
	Maintain and operate compactors and balers, if obtained, and ensure no overfilling occurs.
	Cleaning of all bins and waste and recycling rooms as per the direction of the site manager, or equivalent role.
	Monitor bins to ensure no overfilling occurs.
	Ensure bins and waste storage areas are kept tidy and clean.
	Compliance with the provisions of this WMP.
Tenants	Transfer general waste, recyclables, cardboard waste and hazardous waste to allocated waste and recycling storage areas in the loading docks.
	Adhere to all waste management directions and comply with The Development's waste management provisions as outlined by the Facilities Manager.

APPENDIX A

Council Waste Management Form

APPENDIX A: Waste Management Plan Template

Applicant and Project Details (All Developments)	
Applicant Details	
Application No.	
Name	
Address	
Phone No.	
Email	
Project Details	
Address of Development	1-3 Burrows Road, St Peters
Existing building(s) and/or other structure(s) on site	Three warehouses
Description of proposed development	30 Industrial units, office building and car parking
The details on this form are the provisions and intentions for minimising and managing waste relating to this project. All records demonstrating lawful disposal of waste will be retained and kept readily accessible for inspection by regulatory authorities such as Council, WorkCover NSW, NSW Environment Protection Agency and/or the NSW Department of Environment and Heritage.	
Name	
Signature	
Date	

Demolition (all types of demolition works)				
	Reuse	Recycle	Disposal	
Type of Waste Generated	Estimate Volume (m^3) or weight (t)	Estimate Volume (m^3) or weight (t)	Estimate Volume (m^3) or weight (t)	Specify method of onsite reuse, contractor and recycling outlet and/or waste depot to be used
Excavation Material		697		Delivered to a recycler for separation and recovery
Timber/Gyprock		84		Delivered to a recycler for separation and recovery
Concrete		11,414		Delivered to a recycler for separation and recovery
Bricks		4,319		Delivered to a recycler for separation and recovery

Demolition (all types of demolition works)				
Asphalt		167		Delivered to a recycler for separation and recovery
Metal		855		Delivered to a recycler for separation and recovery
Glass		N/a		
Furniture		N/a		
Fixtures and fittings		N/a		
Floor coverings		N/a		
Packaging (used pallets, pallet wrap)		N/a		
Garden Organics		N/a		
Containers (cans, plastic, glass)		N/a		
Paper/Cardboard		N/a		
Residual Waste			688	Delivered to a disposal site lawfully able to accept it
Hazardous/Special Waste e.g. asbestos (specify)		N/a		
Other (specify)		N/a		

Construction (all types of demolition works)				
	Reuse	Recycle	Disposal	
Type of Waste Generated	Estimate Volume (m3) or weight (t)	Estimate Volume (m3) or weight (t)	Estimate Volume (m3) or weight (t)	Specify method of onsite reuse, contractor and recycling outlet and/or waste depot to be used
Excavation Material		N/a		
Timber (specify)		130		Delivered to a recycler for separation and recovery
Concrete		1.813		Delivered to a recycler for separation and recovery
Bricks		857		Delivered to a recycler for separation and recovery
Tiles		N/a		
Metal		518		Delivered to a recycler for separation and recovery
Glass		N/a		

Construction (all types of demolition works)				
Plasterboard (offcuts)		234		Delivered to a recycler for separation and recovery
Fixtures and fittings		N/a		
Floor coverings		N/a		
Packaging (used pallets, pallet wrap)		N/a		
Garden Organics		N/a		
Containers (cans, plastic, glass)		N/a		
Paper/Cardboard		N/a		
Residual Waste			432	Delivered to a disposal site lawfully able to accept it
Hazardous/Special Waste e.g. asbestos (specify)		N/a		
Other (specify)		N/a		

Ongoing Operation (residential, multi dwelling, commercial, mixed-use and/or industrial)					
	Recyclables		Compostables	Residual Waste	Other
	Paper/Cardboard	Metals/Plastics /Glass			
Amount generated (L per unit per day)	Please refer to Table 11 and Table 12				
Amount generated (L per unit per week)	Please refer to Table 11 and Table 12				
Total amount generated for development	Please refer to Table 11 and Table 12				
Any reduction due to compacting equipment	None proposed				
Frequency of collections	Please refer to Table 13 and Table 14				
Number and size of storage bins required	Please refer to Table 13 and Table 14				
Waste room floor area and dimensions required for storage of bins	Please refer to Table 13 and Table 14				

Note: Show the total volume of waste expected to be generated by the development and the associated waste storage requirements.

Ongoing Operation (residential, multi dwelling, commercial, mixed-use and/or industrial)	
ONSITE WASTE COLLECTION	
Driveway location	Driveways are shown in Figure 2
Driveway and access route width	Driveways are shown in Figure 2 Entrance driveway width is 7.5 m, exit driveway width is 6 m and 30 m between buildings
Type of waste collection area, ie basement, loading dock etc	Collection from in front of each unit
Maximum reversing distance for collection vehicles and configuration of path (straight, curved etc)	Nil
Distance from collection area to the property boundary (<15m)	Less than 5 m
Headroom along vehicle travel path - measured at its lowest point from ceiling, ducting, conduits or any other obstruction.	N/a
Dimensions for vehicle manoeuvring/ turning circles, including on-street turning circles.	No turning or manoeuvring required
Structural capacity of slab for collection areas.	
Ramp gradients	
Vehicle turntable use – Weight capacity – Max wheel base – Provision for overhang	No turntable proposed
Dimensions, layout and floor area provided at bin collection point	N/a
Dimensions, layout and floor area provided for collection vehicle standing/collection area.	N/a
Grade of bin collection area, including for waste collection vehicle.	No gradient
Obstructions to other users during waste collection	None
Legal arrangements for access for collection staff	
Screening and amenity of collection areas.	None. Bins will be stored within each unit and brought outside for collection only

Construction Design (all types of development)
Outline how measures for waste avoidance have been incorporated into the design, material purchasing and construction techniques of the development (refer Section 3.2 of this Plan).
Materials Please refer to Sections 7.5, 7.6 and 8.10
Lifecycle Please refer to Sections 7.5, 7.6 and 8.10
Detail the arrangements that would be appropriate for the ongoing use of waste facilities as provided in the development. Identify each stage of waste transfer between residents' units/commercial tenancies and loading into the collection vehicle, detailing the responsibility for and location and frequency of, transfer and collection. Please refer to Sections 8.4 and 8.13

Plans and Drawings (all developments)	
All Drawings	Yes (Y) / No (N)
Submitted to scale (1:100, 1:200 or 1:500)	
Clearly indicate location of and provisions for storage and collection of waste and recyclables during: • Demolition • Construction • Ongoing operation	
Demolition	Please refer to Section 7.
Size and location(s) of waste storage area(s)	Detail to be determined by a demolition contractor
Access for waste collection vehicles	Detail to be determined by a demolition contractor
Areas to be excavated	Detail to be determined by a demolition contractor
Types and numbers of storage bins likely to be required	Detail to be determined by a demolition contractor
Signage required to facilitate correct use of storage facilities	Please refer to Section 8.12
Construction	Please refer to Section 7.
Size and location(s) of waste storage area(s)	Detail to be determined by a construction contractor

Plans and Drawings (all developments)	
Access for waste collection vehicles	Detail to be determined by a construction contractor
Areas to be excavated	Detail to be determined by a construction contractor
Types and numbers of storage bins likely to be required	Detail to be determined by a construction contractor
Signage required to facilitate correct use of storage facilities	Please refer to Section 7.8
Ongoing Operation	
Space	
Size and location(s) of waste storage areas	Please refer to Table 13, Table 14 and Figure 6. Bins will be stored within each unit.
Recycling bins placed next to residual waste bins	N/a
Space provided for access to and the manoeuvring of bins/equipment	Please refer to Table 13, Table 14 and Figure 6. Bins will be stored within each unit.
Any additional facilities	N/a
Access	
Access route(s) to deposit waste in storage room/area	N/a
Access route(s) to collect waste from storage room/area	N/a
Bin carting grade	
Location of final collection point and space required for collection service	Collections will take place immediately outside each unit
Clearance, turning circles, gradients and strength of internal access driveways and roads	N/a. Bins are stored within each unit and collected immediately outside each.
Direction of traffic flow for internal access driveways and roads	Traffic flow is one way through the site
Amenity	
Aesthetic design of waste storage areas	N/a
Signage – type and location	Please refer to Section 8.12
Construction details of storage rooms/areas including floor, walls, doors, ceiling design, sewer connection, lighting, ventilation, security, wash down provisions	N/a

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